WHAT IS CLAIMED IS:

1. A method for evaluating a wireless link between a transmitter and a first
   receiver in a multiple access wireless communications system, wherein said
   5   transmitter is transmitting information intended for a first receiver in a first
   transmission mode and information intended for said second receiver in a
   second transmission mode that is different from said first transmission mode,
   comprising:
       receiving, at said first receiver, said information that is intended for said
   10 second receiver and that is transmitted in said second transmission mode;
       obtaining, at said first receiver, an error measure for said information that
   is received at said first receiver and intended for said second receiver; and
       determining if said second transmission mode is an acceptable
   transmission mode at least in part based on said error measure obtained for said
   15 information that is received at said first receiver and intended for said second
   receiver.

2. The method of claim 1 further including a step of determining if said second
   transmission mode should be used for subsequent transmissions of
   20   information frames that is intended for said first receiver only if said second
   transmission mode is determined to be acceptable.

3. The method of claim 2 wherein said step of determining if said second
   transmission mode should be used for subsequent transmissions of
   25   information includes a step of comparing a characteristic of said second
   transmission mode to said first transmission mode.

4. The method of claim 2 wherein said step of determining if said second transmission mode should be used for subsequent frame transmissions includes steps of:

    determining if said second transmission mode is higher than a current

5 transmission mode that is used to transmit information intended for said first receiver;

    if said second transmission mode is determined to be higher than said current transmission mode, then using said second transmission mode for subsequent transmissions, from said transmitter, of information intended for said

10 first receiver; and

    if said second transmission mode is determined to be lower than said current transmission mode, then continuing to use said current transmission mode for subsequent transmissions, from said transmitter, of information intended for said first receiver.

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5. The method of claim 2 further including a step of indicating to said transmitter that said second transmission mode should be used for subsequent transmissions of frames intended for said first receiver.

20 6. The method of claim 5 further including a step of indicating to multiple transmitters that said selected transmission mode should be used for subsequent transmissions of frames intended for said first receiver.

7. The method of claim 5 further including a step of transmitting subsequent

25 frames to said receiver in said second transmission mode.

8. The method of claim 1 wherein said step of determining if said second transmission mode is acceptable includes a step of determining if said obtained error measure is above or below an error threshold.

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9. The method of claim 1 further including a step of adding said second transmission mode to a database of acceptable transmission modes only if said obtained error measure for said information transmitted in said second transmission mode is below an error threshold.

10. The method of claim 9 further including a step of selecting a lower transmission mode for information intended for said first receiver from acceptable modes identified in said database.

11. The method of claim 9 further including a step of ranking transmission modes that are added to said database of acceptable transmission modes.

12. The method of claim 11 further including a step of selecting a new transmission mode for information intended for said first receiver at least in part based on said transmission mode rankings.

13. The method of claim 12 further including a step of accumulating error statistics for transmission modes that are added to said database of acceptable transmission modes.

14. The method of claim 13 further including a step of selecting a new transmission mode for information intended for said first receiver at least in part based on said accumulated error statistics.

15. The method of claim 9 further including a step of replacing a current transmission mode with the next higher acceptable transmission mode that is stored in said database of acceptable modes.

16. The method of claim 1 further including a step of projecting the acceptability of other transmission modes that may be used to transmit information intended for said first receiver based at least in part on said mode acceptability determination of said information that is intended for said second
5   receiver and transmitted in said second transmission mode.

17. The method of claim 1 further including steps of:

if said second transmission mode is not acceptable, then ensuring that said first transmission mode used by said transmitter to transmit information
10   intended for said first receiver is no higher than said second transmission mode; and

if said second transmission mode is acceptable, then ensuring that said first transmission mode used by said transmitter to transmit information intended for said first receiver is at least as high as said second transmission mode.

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18. The method of claim 1 further including a step of decoding said information intended for said second receiver into decoded information before said error measure is obtained, said error measure being related to said decoded information.

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19. The method of claim 18 wherein said step of obtaining said error measure includes utilizing information selected from the group consisting of the metric of a winning path in a Virterbi decoder, the output bit/symbol/packet likelihood, a cyclic redundancy check code, a parity check code, a Reed-
25   Solomon code, a BCH code, a Hamming code, a cyclic code, an arithmatic code, and a Golay code.

20. The method of claim 1 wherein said error measure for said information is obtained prior to decoding.

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21. The method of claim 20 wherein said step of obtaining an error measure includes utilizing information selected from the group consisting of the means square error of equalizer, a measure of equalizer convergence, and post-processing signal to noise plus interference ratio.

22. The method of claim 1 wherein said transmitter transmits said information from multiple antennas.

23. The method of claim 1 wherein said multiple access wireless communications system utilizes a multiple access protocol that is selected from at least one of a group of multiple access protocols consisting of: time-division multiple access (TDMA), frequency-division multiple access (FDMA), code-division multiple access (CDMA), space-division multiple access (SDMA), orthogonal frequency division multiple access (OFDMA), wavelength division multiple access (WDMA), wavelet division multiple access, orthogonal division multiple access (ODMA), quasi-ODMA, packet reservation multiple access (PRMA), and carrier sense multiple access (CSMA).

24. A system for evaluating a wireless link in a multiple access wireless communications system comprising:

a transmitter;

a first receiver;

5   a second receiver;

said transmitter including means for transmitting information intended for said first receiver in a first transmission mode and for transmitting information intended for said second receiver in a second transmission mode that is different from said first transmission mode;

10   said first receiver including:

means for receiving, from said transmitter, said information that is intended for said second receiver and that is transmitted in said second transmission mode;

means for obtaining an error measure for said information

15   that is received at said first receiver and intended for said second receiver; and

means for determining if said second transmission mode is an acceptable transmission mode at least in part based on said error measure obtained for said information.

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25. The system of claim 24 wherein said means for determining includes mode logic for determining if said second transmission mode should be used for subsequent transmissions of information that is intended for said first receiver only if said second transmission mode is determined to be acceptable.

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26. The system of claim 25 wherein said mode logic includes logic for:

determining if said second transmission mode is higher than a current transmission mode that is used to transmit information intended for said first receiver;

if said second transmission mode is determined to be higher than said current transmission mode, then using said second transmission mode for subsequent transmissions, from said transmitter, of information intended for said first receiver; and

if said second transmission mode is determined to be lower than said current transmission mode, then continuing to use said current transmission mode for subsequent transmissions, from said transmitter, of information intended for said first receiver.

27. The system of claim 25 wherein said transmitter includes a mode controller for controlling the transmission mode that is used to transmit information from said transmitter, and wherein said first receiver includes means for communicating a preferred transmission mode to said mode controller.

28. The system of claim 27 wherein said transmitter is located in a base transceiver station and wherein said receiver is located in a subscriber unit.

29. The system of claim 24 wherein said means for determining includes mode logic for determining if said obtained error measure is above or below an error threshold.

30. The system of claim 24 wherein said first receiver includes a mode database and wherein said means for determining includes mode logic for adding said second transmission mode to said mode database only if said second transmission mode is determined to be acceptable.

31. The system of claim 30 wherein said mode logic includes means for ranking transmission modes that are added to said mode database.

32. The system of claim 31 wherein said mode logic includes means for selecting a new transmission mode for information intended for said first receiver at least in part based on said transmission mode rankings.

33. The system of claim 32 wherein said mode logic includes means for selecting a new transmission mode for information intended to said first receiver at least in part based on said accumulated error statistics.

34. The system of claim 30 wherein said mode logic includes means for accumulating error statistics for transmission modes that are added to said mode database.

35. The system of claim 30 wherein said mode logic includes means for replacing a current transmission mode with the next higher acceptable transmission mode that is stored in said mode database.

36. The system of claim 24 wherein said first receiver includes mode logic for projecting the acceptability of other transmission modes that may be used to transmit information intended for said first receiver based at least in part on the determinations made from said means for determining if said second transmission mode is acceptable.

37. The system of claim 24 wherein said means for obtaining an error measure is connected to a decoder for detecting errors in said information after said information has been decoded by said decoder.

38. The system of claim 24 wherein said means for obtaining an error measure is connected to a receive processor for detecting errors in said frames prior to information decoding.

39. The system of claim 24 wherein said receiver includes a mode identification unit for identifying the transmission mode of received information and for outputting transmission mode information.

40. The system of claim 24 wherein said transmitter includes multiple antennas for transmitting frames.

41. The system of claim 24 wherein said multiple access wireless communications system utilizes a multiple access protocol that is selected from at least one of a group of multiple access protocols consisting of: time-division multiple access (TDMA), frequency-division multiple access (FDMA), code-division multiple access (CDMA), space-division multiple access (SDMA), orthogonal frequency division multiple access (OFDMA), wavelength division multiple access (WDMA), wavelet division multiple access, orthogonal division multiple access (ODMA), quasi-ODMA, packet reservation multiple access (PRMA), and carrier sense multiple access (CSMA).

42. A system for evaluating a wireless link in a multiple access wireless communications system comprising:

a transmitter;

a first receiver;

5   a second receiver;

said transmitter including means for transmitting frames of information intended for said first receiver in a first transmission mode and for transmitting frames of information intended for said second receiver in a second transmission mode that is different from said first transmission

10   mode;

said first receiver including:

means for receiving, from said transmitter, at least one of said frames that is intended for said second receiver and that is transmitted in said second transmission mode;

15   a frame decoder for decoding said at least one frame that is received at said first receiver and intended for said second receiver into decoded frame information.

error detector, connected to said frame decoder, for obtaining an error measure from said decoded frame information

20   for said at least one frame that is received at said first receiver and intended for said second receiver;

mode logic, connected to said error detector, for determining if said second transmission mode is an acceptable transmission mode at least in part based on said error measure obtained by said

25   error detector for said at least one frame.

43. The system of claim 42 further including a mode identification for identifying the transmission mode of said at least one frame that is received at said first receiver and intended for said second receiver.

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44. The system of claim 43 wherein said mode logic includes means for determining if said second transmission mode should be used for subsequent frame transmissions of frames that are intended for said first receiver only if said second transmission mode is determined to be acceptable.

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45. The system of claim 43 wherein said first receiver includes a mode database accessible to said mode logic and wherein said mode logic includes means for adding said second transmission mode to said mode database only if said second transmission mode is determined to be acceptable.

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46. The system of claim 45 wherein said mode logic includes means for ranking transmission modes that are added to said mode database.

47. The system of claim 46 wherein said mode logic includes means for selecting

15   a new transmission mode for frames intended for said first receiver at least in part based on said transmission mode rankings.

48. The system of claim 45 wherein said mode logic includes means for accumulating error statistics for transmission modes that are added to said

20   mode database.

49. The system of claim 48 wherein said mode logic includes means for selecting a new transmission mode for frames intended to said first receiver at least in part based on said accumulated error statistics.

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50. The system of claim 42 wherein said mode logic includes means for projecting the acceptability of other transmission modes that may be used to transmit frames intended for said first receiver based at least in part on whether said second transmission mode is determined to be acceptable.

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51. The system of claim 42 wherein said transmitter includes multiple antennas for transmitting frames.

52. The system of claim 42 wherein said multiple access wireless communications system utilizes a multiple access protocol that is selected from at least one of a group of multiple access protocols consisting of: time-division multiple access (TDMA), frequency-division multiple access (FDMA), code-division multiple access (CDMA), space-division multiple access (SDMA), orthogonal frequency division multiple access (OFDMA), wavelength division multiple access (WDMA), wavelet division multiple access, orthogonal division multiple access (ODMA), quasi-ODMA, packet reservation multiple access (PRMA), and carrier sense multiple access (CSMA).